

Vesicular Stomatitis

Importance

Vesicular stomatitis is an important zoonotic vesicular disease found in the Americas. This disease has almost identical clinical signs to foot-and-mouth disease in cattle and pigs. The signs of vesicular stomatitis are also very similar to swine vesicular disease and vesicular exanthema of swine. Differentiation of these vesicular diseases is important. The spread of vesicular stomatitis within the United States could bring restrictions on exports of animals and their products to other countries that do not have the disease.

Etiology

Vesicular stomatitis virus (VSV) is a *Vesiculovirus* in the family *Rhabdoviridae*. It is a large bullet-shaped RNA virus. There are two strains of VSV that are considered domestic to the United States: New Jersey and Indiana-1; and there are three other exotic strains in South America: Indiana-2 (Cocal), Indiana-3 (Alagoas) and Pirý.

Species affected

Horses, donkeys, mules, cattle, swine, South American camelids, and humans can be affected by VSV. Sheep and goats are resistant and rarely show clinical signs. Experimentally, a wide host range has been found including deer, raccoons, bobcats, and monkeys.

Geographic distribution

Vesicular stomatitis occurs only in some areas in the United States, Mexico, Central America and the northern part of South America.

Transmission

Vesicular stomatitis can be transmitted by insect vectors, especially sand flies (*Lutzomyia shannoni*) and black flies (*Simuliidae*), which have both been shown to have transovarial transmission. It can also be transmitted by contact with infected animals and contaminated objects. Humans may be infected by contact or aerosol.

Incubation period

The incubation period of VS is usually 3-5 days. Vesicles can occur within 24 hours. The incubation period in humans is 24-48 hours.

Clinical signs

All animal species develop fever. Horses are affected the most severely, with oral and coronary band vesicles leading to signs of drooling, chomping, mouth rubbing, and lameness. The signs in cattle and pigs are very similar to foot-and-mouth disease, with vesicles in the oral cavity, mammary glands, coronary band, and interdigital region. Compared to other vesicular diseases, animals with vesicular stomatitis are more likely to have lesions isolated to only one part of the body, such as the mouth or the feet. Animals recover within 2 weeks, longer with secondary infection.

Post mortem lesions

Mouth and foot vesicles are seen on post mortem. Heart and rumen lesions seen with foot-and-mouth disease are not seen with vesicular stomatitis.

Morbidity and Mortality

Morbidity varies with conditions, but can be up to 90%. Infection is typically sporadic in an exposed group. Death is not as common in young animals as with foot-and-mouth disease. The mortality rate is low.

Diagnosis

Clinical

Diagnosis is similar to that of foot-and-mouth disease due to the similar clinical signs. Vesicular stomatitis affects horses, but foot-and-mouth disease does not. In addition, vesicular stomatitis is not as contagious and does not spread as rapidly through a group of animals. Most VSV-infected animals have lesions in only one area of the body. Heart and rumen lesions typical for foot-and-mouth disease are not seen in vesicular stomatitis. Animals kept in stables during a vesicular stomatitis outbreak are less likely to contract the disease.

Differential diagnosis

In cattle, differentials include foot-and-mouth disease, foot rot, and chemical or thermal burns. Oral lesions can be similar to those seen with rinderpest, infectious bovine rhinopneumonitis, bovine virus diarrhea, malignant catarrhal fever, and bluetongue. In pigs, differentials include foot and mouth disease, swine vesicular disease, vesicular exanthema of swine, foot rot, and chemical and thermal burns.

Laboratory tests

VSV can be isolated in tissue culture, or detected by RT-PCR. Viral antigen can be detected using ELISA, complement fixation, or virus neutralization tests. Paired acute and convalescent serum samples may be tested for antibodies using ELISA, virus neutralization, or complement fixation tests.

Samples to collect

Before collecting or sending any samples from animals with a suspected foreign animal disease, contact the AVIC. These samples should only be sent under secure conditions, by authorized personnel, and to authorized laboratories to prevent the spread of disease. Since vesicular diseases can not be distinguished clinically, and some are zoonotic, samples should be collected and handled with all appropriate precautions. Samples include vesicular fluid, the epithelium covering vesicles, esophageal-pharyngeal fluid, unclotted whole blood collected from febrile animals, and fecal and serum samples from infected and non-infected animals.

Recommended actions if vesicular stomatitis is suspected

Notification of authorities

State and federal veterinarians should be immediately informed of any suspected vesicular disease. Federal: Area Veterinarians in Charge (AVICS)

http://www.aphis.usda.gov/vs/area_offices.htm

State vets: <http://www.aphis.usda.gov/vs/sregs/official.html>

Quarantine and Disinfection

Isolation of animals showing clinical signs helps control the spread of vesicular stomatitis within a herd. There should be no movement of animals from an infected property for at least 30 days after all lesions are healed. Insect control may help prevent disease spread. Disinfectants include 2% sodium carbonate, 4% sodium hydroxide, 2% iodophore disinfectants, and chlorine dioxide.

Public health

Vesicular stomatitis occurs often in humans as an influenza-like illness rarely causing vesicles. Infected humans develop fever, headache, muscular aches, and, rarely, oral blisters similar to herpes virus. Recovery usually occurs within 4-7 days.

For More Information

World Organization for Animal Health (OIE)

<http://www.oie.int>

OIE Manual of Standards

http://www.oie.int/eng/normes/mmanual/a_summry.htm

OIE International Animal Health Code

http://www.oie.int/eng/normes/mcode/A_summry.htm

USAHA Foreign Animal Diseases book

http://www.vet.uga.edu/vpp/gray_book/FAD/

References

Mebus, C.A. "Vesicular stomatitis." In *Foreign Animal Diseases*. Richmond, VA: United States Animal Health Association, 1998, pp. 419-423.

"Vesicular stomatitis." In *Manual of Standards for Diagnostic Tests and Vaccines*. Paris: World Organization for Animal Health, 2000, pp. 93-99.